

Global Wireless Device Approvals & Certification Overview

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Topics

1. **About UL WiSE**
2. **European Market Access / R&TTE Directive Overview**
3. **United States & Canadian Certification Overview**
4. **Global Approvals: International Market Regulatory Requirements**

Focussed around wireless devices!



UL WiSE

Who are we?

A portrait of a Black woman with short, curly dark hair, wearing a black headband and glasses. She is smiling slightly and wearing a black polo shirt. The background is blurred, showing some greenery and a building.

TO HELP MAKE THE WORLD SAFER IN THE PLACES WHERE PEOPLE LIVE AND WORK

World's leading electrical safety testing and certification company

- 6,900 employees

Leading safety brand

- 20 billion UL Marks on products
- 100,000 products tested annually
- World #1 for FCC Grant issuance

Worldwide presence

- 66,150 customers in 100 countries
- 68 labs and certification facilities across the world

Underwriters Laboratories

 **product safety**

 **environment**

 **university**

 **verification**

 **life & health sciences**

- product safety
- market access
- regulations

- claims validation
- sustainability
- standards

- training & education
- technical expertise
- personal certification

- security, wireless, interoperability, EMC
- energy efficiency
- performance

- human safety
- product safety

life safety & security

building materials

power & controls

energy

high tech

appliances/HVAC

lighting

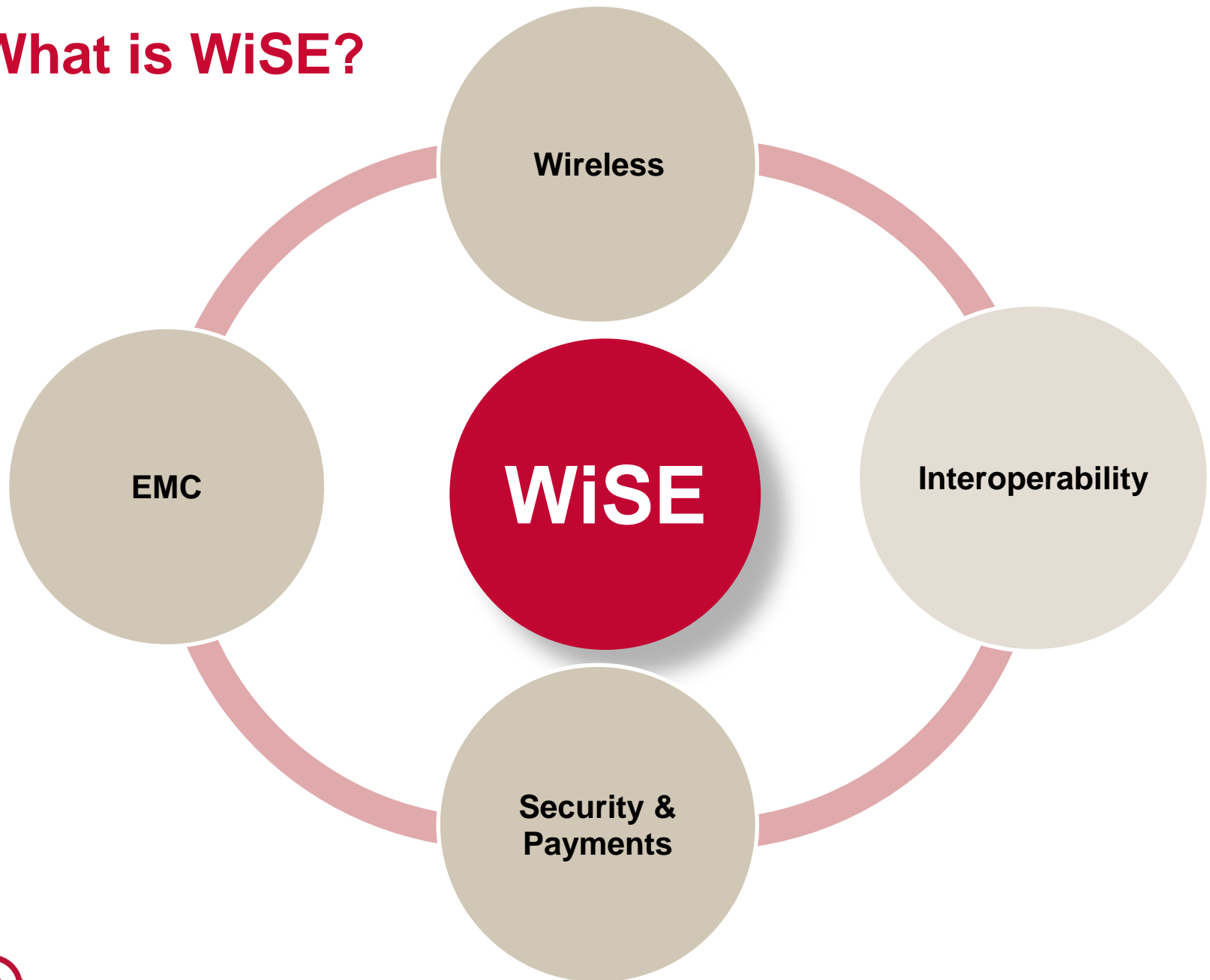
chemicals

wire & cable

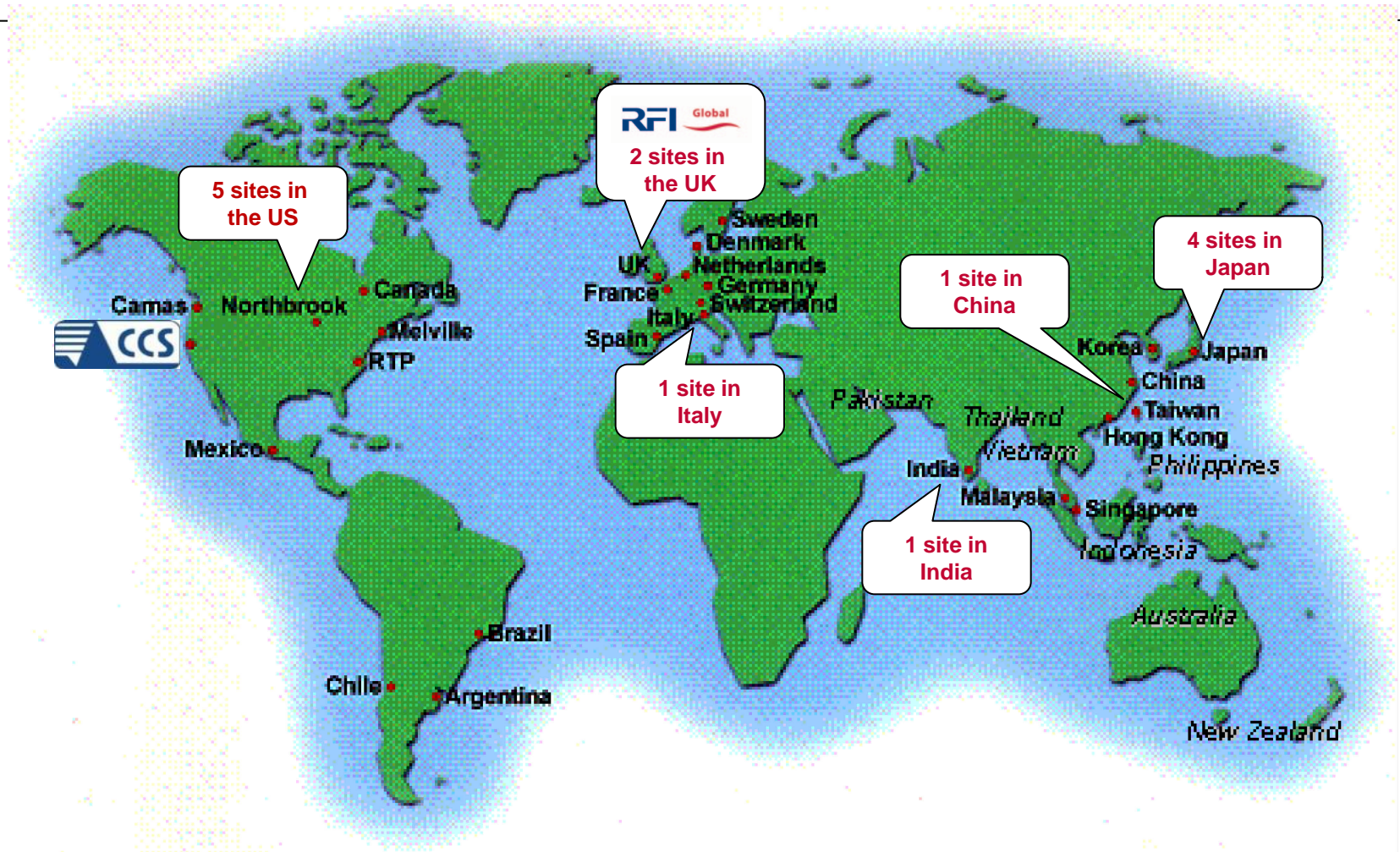
medical

food & water

What is WiSE?



UL Verification Services: WiSE Locations



Global Approvals

Regulatory Requirements

Each region is different, but all based on similar themes:

- Electromagnetic Compatibility (EMC)
- Radio Performance
- Safety (including Human RF Exposure)

- and having suitable documented evidence of compliance

In Europe these requirements are directly related to the European Union Directives and the Articles within them that must be conformed to in order to demonstrate compliance.

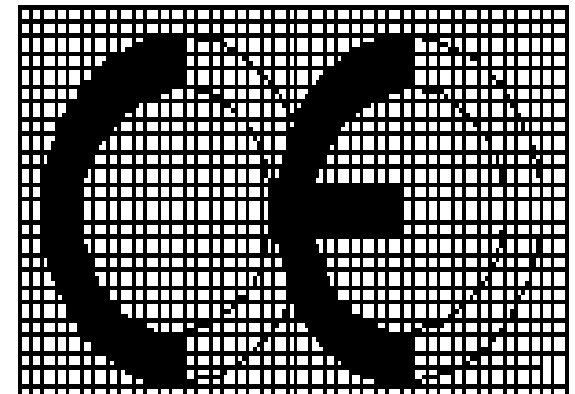
Knowing the environment for use of the product is essential to understand the applicable requirements.



European Market Access / The R&TTE Directive

What is CE Marking?

- Legal requirement for all electrical products sold in Europe
- The CE marking on a product is a sign that the product complies with **ALL** new approach directives which apply to it, and are in force at the time of its supply
- It is a sign to the authorities to allow the free circulation of compliant goods in the European Community
- For most radio transmitter products, this means complying with the R&TTE Directive
- Remember, you must meet the requirements of **ALL** applicable Directives
- EU Directives include (as example):
 - EMC
 - R&TTE (Wireless)
 - Automotive
 - Medical
 - Low Voltage (electrical safety)



What it is not!

- A mark of quality
- A mark which confirms that a product complies with a standard
- An “approval” mark
- A mark of origin



Introduction to the R&TTE Directive...

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- Radio and Telecommunications Terminal Equipment (R&TTE) Directive
- Otherwise known as 1999/5/EC
- A self-declaration approvals process for intentionally transmitting devices
- Adopted 7th April 1999
- Implemented 8th April 2000
- Transition period ended 7th April 2001



Scope of the R&TTE Directive...

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“The R&TTE Directive establishes a regulatory framework for placing on the market, free movement and putting into service of radio equipment and telecommunications terminal equipment (R&TTE) in the Community. A number of types of equipment are exempted from the Directive: equipment exclusively used for non-civil purposes and equipment covered by other Community instruments.”



R&TTE Directive – Benefits for manufacturers...

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- Removed National provisions – only test once for Europe
- Time to market reduced
- Assessment costs reduced, no “in-country” type approval
- No compulsory third party testing
- New technologies are not inhibited



R&TTE Directive Overview

- Who is responsible?
- The Essential Requirements
- Conformity assessment procedures



Who Is Responsible?

“The manufacturer, his authorised representative within the community or the person responsible for placing the apparatus on the market.

Where neither the manufacturer nor his authorised representative is established within the community, the obligation to keep the technical documentation available is the responsibility of the person who places the product on the community market place.”

Essential Requirements

- Article 3.1(a) Safety (LVD, acoustic shock and EMF [Maximum Permissible Exposure or Specific Absorption Rate])
- Article 3.1(b) EMC
- Article 3.2 Radio



Article 3.1(a) Safety

The protection of the health and the safety of the user and any other person, including the objectives with respect to safety requirements contained in Directive [was 73/23/EEC now 2006/95/EC), but with no voltage limit applying

MPE / SAR requirements are covered by this Article

Acoustic shock requirements are covered by this Article



Article 3.1(b) EMC

The protection requirements with respect to Electromagnetic Compatibility, this can refer to standards listed for the EMC Directive, if applicable (normally applied for telecommunications terminal equipment [TTE])



Article 3.2 Radio

Radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communication and orbital resources so as to avoid harmful interference

Applicability of Conformity Assessment Procedures

At the choice of the manufacturer, compliance of the apparatus with the essential requirements identified in Article 3(1)(a) and (b) may be demonstrated using the procedures specified in LVD Directive and EMC Directive respectively, where the apparatus is within the scope of those Directives

For non-wireless products (TTE)

- Annex II (IV or V)

For wireless products using harmonised standards

- Annex III, IV or V

For wireless products not using or only partially using harmonised standards

- Annex IV or V



Applicability of Conformity Assessment Procedures

For wireless products using harmonised standards:

- Harmonised standards as listed in the Official Journal of Europe Union (OJEU), they are not simply standards with the words “Harmonised” on the front page.
- The current OJEU harmonised standards list can be found at:
 - http://ec.europa.eu/enterprise/policies/european-standards/documents/harmonised-standards-legislation/list-references/rtte/index_en.htm

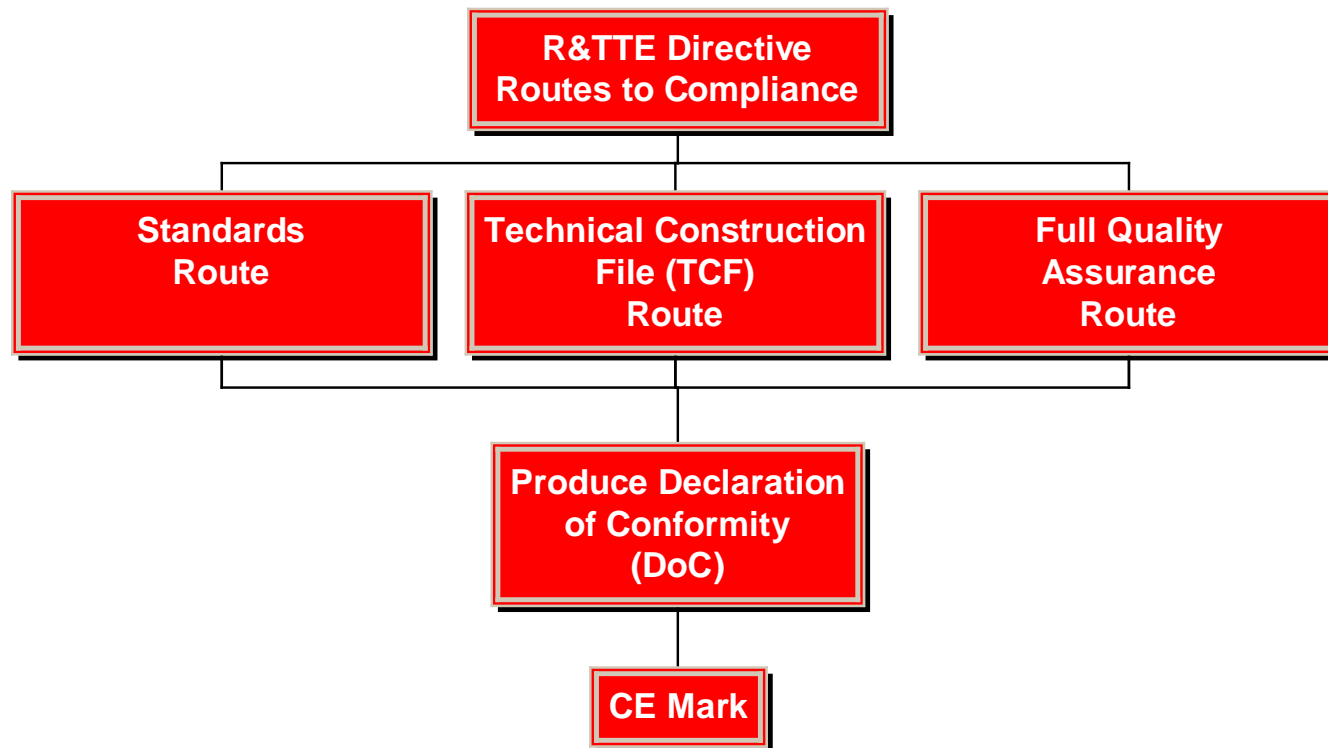
For wireless products not using or only partially using harmonised standards:

- Require a Notified Body “Essential test suite” and/or a Notified Body Opinion.



Routes to Compliance

Routes to Compliance...



Routes to Compliance...

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- Annex III – Standards Route
- Annex IV – Technical Construction File Route
- Annex V – Full quality assurance route



Annex III – Standards route...

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- Harmonised standards are identified that cover all essential requirements:
 - ✓ Radio
 - ✓ EMC
 - ✓ Safety
- Test the product against the standards
- Produce Declaration of Conformity
- Apply CE Mark and Alert Symbol if applicable



R&TTE Official Journal (OJEU)...

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Lists all harmonised standards that can be applied to cover essential requirement:

C 201/8

EN

Official Journal of the European Union

24.8.2006

European standardisation organisation ⁽¹⁾	Reference and title of the standard (Reference document)	Reference of the superseded standard	Date of cessation of presumption of conformity of the superseded standard Note 1	Article 1999/5/EC
ETSI	EN 300 328 V1.4.1 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonised EN covering essential requirements under Article 3(2) of the R&TTE Directive	EN 300 328-2 V1.2.1	Date expired (30.4.2006)	Article 3(2)



Annex IV – Technical Construction File Route...

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Where harmonised standards are not available:

- A Notified Body must be used to determine the essential requirement test suites
- Test the product against the defined test suites
- Compile the Technical Construction File (TCF)
- A Notified Body assesses the TCF and gives an opinion
- If the Opinion is positive, produce a Declaration of Conformity
- Apply CE, Alert Symbol if applicable and Notified Body number

A manufacturer can disregard a Notified Body opinion!



Annex IV – Technical Construction File Route...

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Why chose this route?

- No harmonised standards available
- Assessment of a family range is required



Annex V – Full Quality Assurance...

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Full quality assurance is the procedure whereby the manufacturer ensures and declares that the products concerned satisfy the requirements of the Directive that apply to them using their own audited quality system.

The quality system must ensure compliance of the products with the requirements of the Directive that apply to them.



The Technical Construction File (TCF)

The TCF

In the “Directive”:

- **Article 2, Definitions, sub part (g)**

"technical construction file" means a file describing the apparatus and providing information and explanations as to how the applicable essential requirements have been implemented;

- **Annex II sub part 4**

“The technical documentation must enable the conformity of the product with the essential requirements to be assessed. It must cover the design, manufacture and operation of the product, in particular:

- a general description of the product,
- conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc.,
- descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the product,
- a list of the standards referred to in Article 5, applied in full or in part, and descriptions and explanations of the solutions adopted to meet the essential requirements of the Directive where such standards referred to in Article 5 have not been applied or do not exist,
- results of design calculations made, examinations carried out, etc.,
- test reports.”



The TCF

In the “Directive”:

Annex IV

(Technical Construction File)

This Annex consists of Annex III plus the following supplementary requirements:

The technical documentation described in point 4 of Annex II and the declaration of conformity to specific radio test suites described in Annex III must form a technical construction file.

And then there is the R&TTE CA guidance note:

<http://www.rtteca.com/TGN15Rev1.pdf>



The TCF – In Simple Terms

- Requirements and obligations
- Specific elements
- The rationale
- Unified documentation
- Defining the product
- The DoC (applying EN54014)
- Variants (manufacturer's declaration of similarity)
- Test results



Requirements And Obligations

- The TCF must adequately describe the single product type, family or range that it covers
- The TCF must contain sufficient evidence to demonstrate compliance for all product types, including variants within its scope
- This can be in the form of test results, technical design justification or a combination of both



Specific Elements

- Product description
- Technical design data relevant to the case for compliance
- Test results
- Declaration of similarity of variants
- Technical rationale (the case for compliance)
- Declaration of Conformity with the Directive
[R&TTE includes LVD and EMC]
- Description of Labelling ("CE" mark)



Defining The Product

- What it is and its intended use
- Type or model number
- Description of family variants and scope of features
- Range of model numbers for family variants
- Reference drawings, pictures or plans
- User or installation manual



Unified Documentation

- Consistent numbering
- Titles can be linked to the product
- Issue of the document is correct to the tested product
- Top level BOM identifies major components



Test Results

- Test samples to be properly identified as representative of product or family (not prototypes or “golden” sample)
- Choice of worst case samples to cover other variants to be justified in rationale
- Proper and appropriate test methodologies
- Measurement uncertainties included or their absence justified
- Actual measurement results not just summary statements (where appropriate - not just “pass / fail”)



Variants

(manufacturers' declaration of similarity)

- Define what the differences are
- Why those differences do not effect compliance
- Worst case and why



The Rationale

- Explains conformity assessment choice
- Includes technical justification based on design for claiming compliance where measurement not used
- Explains significance of intended use environment where this impacts on choice of test levels and limits
- Justification for using non harmonised standards or test methods
- Justifies choice of test samples



The Declaration of Conformity (DoC)

- EN54014
- Manufacturer's name and address
- State Applicable directive (s)
- State Standards with either version number or year of publication
- Identity of Responsible person
- Signed by
- Where is it used



The Notified Body Opinion

- Issued when compliance has been demonstrated by TCF
- Not mandatory if you have followed Harmonised Standards as listed in the Official Journal of Europe (OJEU)
- Often used where the TCF includes untested variants and/or a third party agreement of rationale
- Often used by “module” manufacturers to maintain confidentiality
- Evidence that case for compliance has been approved by independent third party “expert”
- Demonstrates due diligence



Maintaining Compliance Through The TCF

- Via your company “document control” procedures
- Review and acceptance (or not) of design changes
- Periodic audit and review
- Management Systems (Typically ISO 9000 series)
- Monitoring updates to Harmonised Standards (No “grandfathering”)



Maintaining The TCF

- If the product changes:
 - Update the TCF
 - Confirm, does the product need to be re-assessed?
 - If so, fully or partially retested?
- Who keeps the TCF?
- Who can look at the TCF?
- How long do you have to keep the TCF?



Maintaining The TCF

- If the product changes:
 - Update the TCF
 - Confirm, does the product need to be re-assessed?
 - If so, fully or partially retested?
- Who keeps the TCF?
The manufacturer or his authorised representative established within Community
- Who can look at the TCF?
Market Surveillance Authorities of any Member State
- How long do you have to keep the TCF?
10 years after the last date of manufacture of the product



Useful Information

Harmonised Frequency Bands...

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Once a transmitting products has met the requirements of the R&TTE Directive Country Notifications may be required.

There are a number of Harmonised Frequency bands that all EU members states have adopted, depending on the following:

- The assigned frequency band
- The product allocation

The classification of radio equipment can be found at <http://www.ero.dk/rtte>



[http://www.ero.dk/rtte](#)
ECO

European Communications Office

ECO

european communications office

[General information](#)
[ECC Activities](#)
[Deliverables](#)
[Events](#)
[Topics/Projects](#)
[CEPT Administrations](#)

Indicative list of equipment sub-classes in accordance with the R&TTE Directive (1999/5/EC)

Page updated: 26 August 2010

Related Links

[R&TTE Directive](#)
[R&TTE Guide](#)
[R&TTE Compliance Association](#)
[EFIS and National Frequency Tables](#)

[Top](#)

Disclaimer: ECO has no responsibility for the content of the list of sub-classes published in this page. The list is maintained on the ECO web site on the request of the European Commission. The list has been developed by the T-CAM Committee of the European Commission. All queries on the list and its content should be made to the European Commission.

Sub class	Frequency band	Application
The subclasses:	2 to 6, 8 and 10 are obsolete	
9	890-915/935-960 MHz	GSM
	880-890/925-935 MHz	
	876-880/921-925 MHz	GSM-R
9	1710-1785/1805-1880 MHz	GSM
11	1525.0-1544.0 MHz	
	1555.0-1559.0 MHz	
	1631.5-1634.5 MHz	Land Mobile Earth Stations
	1656.5-1660.5 MHz	
12	10.7-11.7 GHz	
	12.5-12.75 GHz	Land Mobile Earth Stations
	14.0-14.25 GHz	
13	380-385 MHz	
	390-395 MHz	TETRA
14	1610-1613.5 MHz	
	1613.8-1626.5 MHz	Satellite-Personal Communications (PCN) earth stations
	2483.5-2500 MHz	
	2483.5-2500 MHz	
15	1980-2010 MHz	
	2170-2200 MHz	Satellite-Personal Communications (PCN) earth stations
16	1525.0-1544.0 MHz	
	1555.0-1559.0 MHz	
	1626.5-1645.5 MHz	Land Mobile Satellite Service
	1656.5-1660.5 MHz	
18	1880-1900 MHz	DECT
19	40.660-40.700 MHz	Non Specific Short Range Devices

Product Marking Requirements...

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Labelling requirements:

- CE mark
- Equipment Class Identifier (Alert Symbol)
- Notified Body number (if used)

Radio Equipment		
Conformity Procedure	The "use" of frequency band	
	is harmonised	is <u>not</u> harmonised
Annex III (Annex II + specific product tests) (use of harmonised standards)		
Radio tests in Harmonised Standard	CE	CE ⚠
Radio tests <u>not all</u> in Harmonised Standard	CE NBnr	CE NBnr ⚠
Annex IV (technical construction file) or Annex V (Full Quality assurance)	CE NBnr	CE NBnr ⚠



United States & Canadian Certification Overview

North American/Canadian vs European Approvals

North American/Canadian Approval	Europe Approvals
Type Approval process	Self Declaration
Focused on Radio Certification	Focused on Radio, EMC and Safety
Product must fit Rule Parts/Standards	Search for Standards to match product
Evaluates RF Exposure	Evaluates RF Exposure
Application in public domain	Documentation held by manufacturer
Modular approval	Modular approval
TCBs\CABs perform market surveillance	Few EU Countries perform surveillance



The Regulations

North American approvals:

- Governed by The Federal Communications Commission (FCC)

Canadian approvals:

- Governed by Industry Canada

Both follow very similar approvals approaches but they are **not** the same.



FCC & Industry Canada Approvals

Certification is a mandatory process for radio products made by direct application or via:

- Telecommunication Certification Body (TCB) for FCC, or
- Conformity Assessment Bodies for Industry Canada

Copy of the regulations can be found here...

- FCC: <http://transition.fcc.gov/oet/info/rules/>
- Industry Canada: http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/h_tt00011.html



Routes to FCC/IC Approval

For FCC, there are three main routes:

- Route 1 – Verification (non-wireless devices)
- Route 2 – Declaration of Conformity Route (DoC) (non-wireless devices)
- Route 3 – Certification (wireless devices)

For Industry Canada, there a slightly wider range of standards for non-wireless devices but all wireless devices require type approval and issuance of a technical acceptance certificate



FCC Verification & DoC Routes

1. Manufacturer finds an FCC approved test facility
2. Test the product
3. Get a test report
4. Hold the report on file
5. Apply the appropriate equipment label
6. Sell product in US

For the DoC route, you also need to make available the DoC to the user.



FCC Verification & DoC Routes

Type of device	Equipment authorization required
TV broadcast receiver	Verification.
FM broadcast receiver	Verification.
CB receiver	Declaration of Conformity or Certification.
Superregenerative receiver	Declaration of Conformity or Certification.
Scanning receiver	Certification.
Radar detector	Certification.
All other receivers subject to part 15	Declaration of Conformity or Certification.
TV interface device	Declaration of Conformity or Certification.
Cable system terminal device	Declaration of Conformity.
Stand-alone cable input selector switch	Verification.
Class B personal computers and peripherals	Declaration of Conformity or Certification. ¹
CPU boards and internal power supplies used with Class B personal computers.	Declaration of Conformity or Certification. ¹
Class B personal computers assembled using authorized CPU boards or power supplies.	Declaration of Conformity.
Class B external switching power supplies	Verification.
Other Class B digital devices & peripherals	Verification.
Class A digital devices, peripherals & external switching power supplies.	Verification.
Access Broadband over Power Line (Access BPL)	Certification.
All other devices	Verification.



FCC/IC Certification Route

1. Manufacturer finds an FCC/IC approved test facility
2. Test the product
3. Get a test report
4. Customer supplies application documentation - 'Exhibits'
5. TCB/CAB (or FCC/IC in case of Direct Application) performs a Administrative & Technical Review
6. If product is approved:
 - Exhibits are uploaded to the FCC/IC website
 - TCB/CAB (or FCC/IC) issues the approvals Grant / Technical Acceptance Certificate
 - Client can sell in North America / Canada

If not approved, manufacturer can not sell the product!!



FCC / IC Certification Routes

Three main certification routes for wireless devices:

- **Full certification route**
- **Full modular approval route**
- **Limited modular approval**



Full Certification Route

- The certification/approval of an end product
- Full testing in accordance with the appropriate FCC Rule Parts or Industry Canada RSS Standards
- FCC/TCB or IC/CAB applications and listing fees
- Grant of certification issued



Full Modular Approval

Based on FCC Part 15 C 212, conditions on which modular approval can be granted are as follows:

- The radio elements of the modular transmitter must have their own shielding
- The modular transmitter must have buffered modulation/data inputs
- The modular transmitter must have its own power supply regulation
- The antenna must either be permanently attached or employ a “unique” antenna coupler
- The modular transmitter must be tested in a stand-alone configuration



Modular Approval

Based on FCC Part 15 C 212, conditions on which modular approval can be granted are as follows:

- The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number
- The modular transmitter must comply with any specific rules or operating requirements that ordinarily apply to a complete transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements
- The modular transmitter must comply with any applicable RF exposure requirement in its final configuration



Limited Modular Approval

Approval of a modular transmitter that does not meet all the criteria defined in Part 15 C 212.

- Full testing in accordance with the appropriate rule parts of the FCC regulations and full listing fees apply
- All host units in which the module can be used must be listed on the Grant of Application.
- May incur additional application and listing fees to cover additional host devices
- If buying a pre-approved module the module manufacturer will own the FCC Grant that requires updating to include a new host product



Application Process

Upon completion of testing a submission must be made to the FCC/IC.

A compliant product will be issued an FCC Grant of Certification / IC Technical Acceptance Certificate.

Typical documentation required:

- Application for Equipment Authorisation Form
- Confidential Agreement Form
- Agency Letter
- FRN Number
- Grantee Code
- Test Report(s)
- RF Exposure Information (if applicable)
- Test Set Up Photographs (may be included in the test report)
- Operational Description
- External and Internal Product Photographs
- Tune Up Information
- User Manual
- Block Diagram
- Schematics
- Parts Lists/BOMs
- Label Information



FCC Registration Number (FRN)...

The FCC Registration Number (FRN), is a 10-digit number that is assigned to an entity registering with the FCC.

The entity that you register will have a unique FRN that is used to identify each entity's business dealings with the FCC.

The FCC will use the FRN to determine if all of an entity's fees have been paid.



FCC Grantee Code

Assigned by the FCC and is obtained online from the following FCC web site:

<https://fjallfoss.fcc.gov/oetcf/eas/forms/GranteeRegistration.cfm>

Important Note:

There is a charge payable on line at the time of Grantee Registration. The fee required must be submitted and validated within 30 days of the issuance of the Grantee Code, or the code will be removed from the Commission's records and a new Grantee Code will have to be obtained.



FCC Labelling Requirements

The FCC ID is a unique identifier that indicates an approved FCC product. It comprises of two parts:

1. The Grantee code

- Assigned permanently by the FCC to a specific grantee, normally the manufacturer, and this is only valid for that party at that address. It comprises a unique combination of three letters and numbers.

2. The Equipment Product Code (EPC)

- Assigned by the applicant, a minimum of 1 character and a maximum of 14 characters and must consist of only capital letters, Arabic numerals or combination thereof, the hyphen or dash (-).The model name subject to the above is normally used.

EXAMPLE: FCC ID: XXX123ABC

- Where XXX is Grantee Code & 123ABC is the Equipment Product Code



FCC Labelling Requirements cont...

Please be aware of a future forthcoming change from the FCC:

They are running out of Grantee Code letters, so the following will be implemented regarding new Grantee Codes:

- Grantee Code expanded from three to five characters
- 1st character of five always a number
- Product Code will be reduced to a maximum of 12 characters
- Full FCC ID remains a maximum of 17 characters

EXAMPLE: FCC ID: 1XXXX12345ABCDE

Where 1XXXX is Grantee Code and 12345ABCDE is Equipment Product Code



Industry Canada - Labelling Requirements

The Industry Canada Certification Number format is:

“IC: XXXXXX-YYYYYYYYYYY”

- Where:
 - “XXXXXX” is the Company Number (CN) assigned by Industry Canada, made of at most 6 alphanumeric characters (A-Z, 0-9), including a letter at the end of the CN to distinguish between different company addresses.
 - “YYYYYYYYYYY” is the Unique Product Number (UPN) assigned by the applicant, made of at most 11 alphanumeric characters (A-Z, 0-9)

In addition user manual text is required (as is for FCC) however some text must be translated into French.



Industry Canada - Company Number

- Similar to the FCC Grantee Code, the IC Company Number is unique to the company require product certification
- It is assigned by Industry Canada
- To obtain a new CN please send an email to: certification.bureau@ic.gc.ca



Industry Canada - Additional Requirements

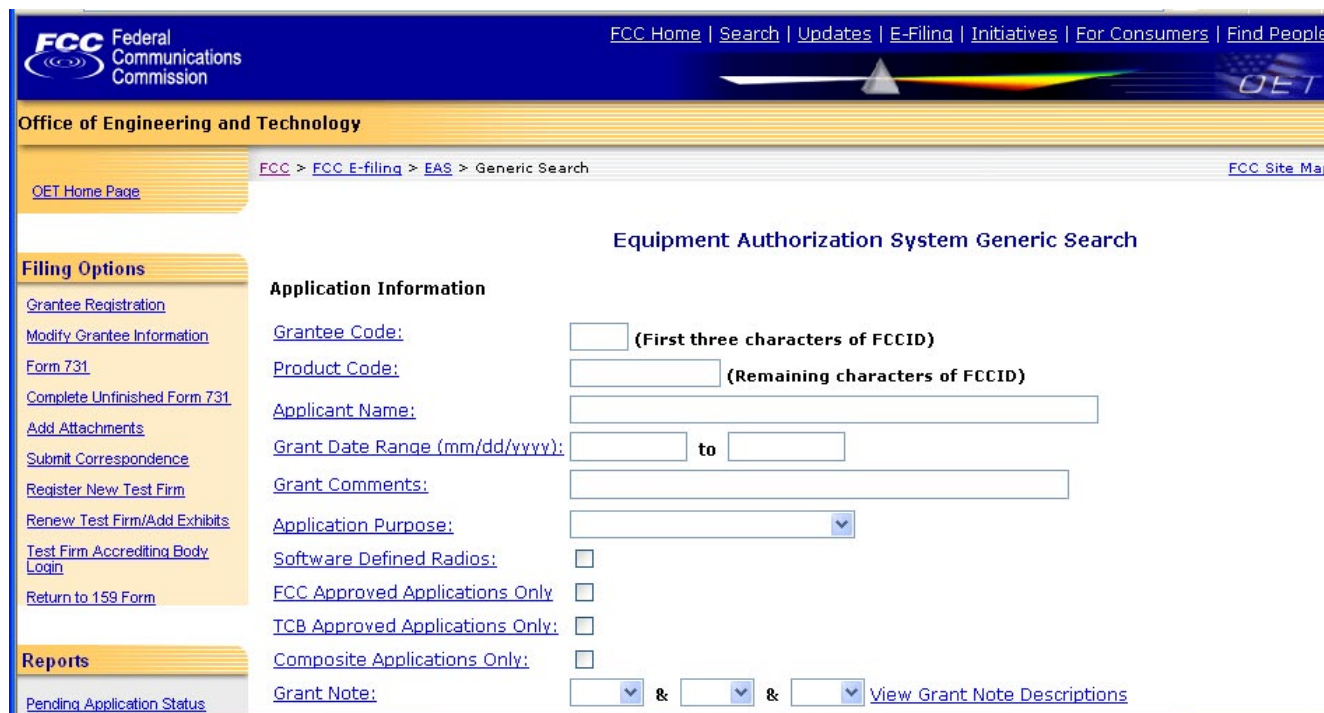
- Canadian in-country representative capable of responding to enquiries and who can provide post-certification audit samples at no charge to Industry Canada
- Covering letter explaining the type of certification services requested and a brief description of the radio equipment
- RSP-100 Appendix A from – Application and Agreement for Certification Services
- RSP-100 Appendix B from – test Report Cover Sheet
- RSS-102 Appendix A – Technical Brief Cover Sheet and B – Declaration of RF Exposure Compliance (or C – Declaration of RF Exposure Compliance for Exemption from Routine Evaluation Limits) forms
- User manual regulatory statements in English and French
- Model number must appear on label



The Application Process - FCC

FCC Website and Product Listings

All listings are held in the public domain on the FCC OET website:



The screenshot displays the FCC OET website interface. At the top, the FCC logo and navigation links are visible. The main heading is "Office of Engineering and Technology". Below this, the breadcrumb trail reads "FCC > FCC E-filing > EAS > Generic Search". The page title is "Equipment Authorization System Generic Search".

Filing Options

- [Grantee Registration](#)
- [Modify Grantee Information](#)
- [Form 731](#)
- [Complete Unfinished Form 731](#)
- [Add Attachments](#)
- [Submit Correspondence](#)
- [Register New Test Firm](#)
- [Renew Test Firm/Add Exhibits](#)
- [Test Firm Accrediting Body Login](#)
- [Return to 159 Form](#)

Application Information

Grantee Code: (First three characters of FCCID)

Product Code: (Remaining characters of FCCID)

Applicant Name:

Grant Date Range (mm/dd/yyyy): to

Grant Comments:

Application Purpose:

Software Defined Radios: ☐

FCC Approved Applications Only: ☐

TCB Approved Applications Only: ☐

Composite Applications Only: ☐

Grant Note: & & [View Grant Note Descriptions](#)

Reports

- [Pending Application Status](#)



The Application Process – Industry Canada

IC Website and Product Listings

All listings are held in the public domain on the REL listing website:



The screenshot displays the Industry Canada website interface. At the top, there are logos for Industry Canada, Industrie Canada, and the word "Canada". Below the logos is a banner featuring a globe, a red maple leaf, and silhouettes of people. The main navigation bar includes links for Français, Home, Contact Us, Help, Search, and canada.gc.ca. Below this is a breadcrumb trail: Industry Canada > Radio, Spectrum and Telecommunications > Certification and Engineering Bureau > Wireless Program.

The left sidebar contains a menu with the following items:

- Industry Canada
- Programs and Services
- Certification and Engineering Bureau
- Home
- Search
- Wireless Program
- Equipment Certification
- Type of Radio Equipment
- Frequently Asked Questions
- Test Site Registration
- Radio Equipment

The main content area is titled "Certification and Engineering Bureau" and "Radio Equipment List (REL)". It features a search form with the following fields and criteria:

Search for	Your Criteria
Company Number:	<input type="text"/> (99999AA)
Company Name:	<input type="text"/> (Alpha-Numeric)
Model:	<input type="text"/> (Alpha-Numeric)
Certification Number:	<input type="text"/> (Alpha-Numeric)
Radio Specification:	<input type="text"/> (BETS99-RSS999)
Lower Frequency (MHz):	<input type="text"/> (0-99999)
Upper Frequency (MHz):	<input type="text"/> (0-99999)
Occupied Bandwidth (kHz):	<input type="text"/> (0-99999)
Emission Code:	<input type="text"/> (Alpha-Numeric)
Lower Power (Watts):	<input type="text"/> (0-99999)
Upper Power (Watts):	<input type="text"/> (0-99999)



Permissive Changes

Making Changes To Certified Products

Once a product is certified, how are product changes managed?

The FCC process is called the “Permissive Change” route and three classes are available:

- Class I Permissive Change
- Class II Permissive Change
- Class III Permissive Change

Important Note:

- These do not require a new application/filing
- None of the class of changes shall result in a change in identification



Making Changes To Certified Products...

None of the classes of changes shall result in a change in identification,
however...

Changes to the basic frequency determining and stabilizing circuitry (including clock and data rates), frequency multiplication stages, basic modulator circuit or maximum power or field strength ratings **will always require a new FCC ID and a new equipment authorisation application to the FCC.**



Making Changes To Certified Products

Permissive Changes generally consider changes in the following product areas (taken from FCC guidance):

- Antenna changes
- Printed Circuit Board (PCB)
- Hardware changes
- Enclosure changes
- Software changes
- Miscellaneous changes



Class I Permissive Change (C1PC)

Key Criteria

- Modifications that do not degrade the radio performance characteristics of the product from those reported when certification was granted
- Generally cosmetic or non-radio changes
- No filing is required
- A C1PC can only be made by the original FCC Grant holder (normally the manufacturer)



Class II Permissive Change (C2PC)

Key Criteria

- Modifications that degrade the radio performance characteristics of the product from those reported when certification was granted but still meet the requirements of the applicable rules
- A TCB/CAB must be consulted to determine what tests must be repeated
- If the product continues to meet the requirements of the applicable rules the original FCC/IC application must be updated with full details of the modifications supported by the new test results



Class III Permissive Change (C3PC)

Key Criteria

- Software modifications of a software defined radio transmitter that changes the frequency range, modulation type or maximum output power from those reported when certification was granted but still meet the requirements of the applicable rules.
- A TCB or FCC must be consulted to determine what tests must be repeated.
- If the product continues to meet the requirements of the applicable rules the original FCC application must be updated with full details of the modifications supported by the new test results.



RF Radiation Exposure Evaluation in North America

RF Radiation Exposure Evaluation...

There are two exposure categories that will determine how an evaluation is to be processed:

- Occupational/Controlled Exposure
- General Population/Uncontrolled Exposure

Confirming “Mobile” or “Portable” classification and “Occupational/Controlled” (as defined in FCC Rule Parts 2.1091 and 2.1093) or “General Population/Uncontrolled” conditions **MUST** be established in order to determine RF exposure evaluation method and limits to apply



RF Radiation Exposure Evaluation...

How do you evaluate RF Exposure for Mobile devices?

- FCC Part 2.1091 covers Cellular Radiotelephone, Personal Communications, Satellite Communications, General Wireless Communications, Wireless Communications, Maritime and Specialized Mobile Radio devices
- Must operate at 1.5 GHz or below and effective radiated power is 1.5 watts or more, or if they operate above 1.5 GHz and their ERP is 3 watts or more
- Generally done by a Maximum Permissive Exposure (MPE) calculation



RF Radiation Exposure Evaluation...

How do you evaluate RF Exposure for Portable devices?

- Specific Absorption Rate (SAR) testing



RF Radiation Exposure Evaluation...

For the purposes of RF exposure evaluations, products fall into one of these categories:

Mobile Devices

- A transmitting device designed to be used in other than fixed locations with a **separation distance of at least 20 cm** from the body of the user or nearby persons

Portable Applications

- A transmitting device **designed to be used within 20 cm** of the body of the user



RF Radiation Exposure Evaluation – Industry Canada requirements

Canadian RF requirements are very similar but not identical e.g. additional SAR evaluation requirements with regards to bystanders for laptop type computers with antenna built-in on display screens. Requirements are detailed in RSS-102 *Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)*.

FCC KDB Publications SAR procedures are generally accepted and referenced within RSS-102 where applicable.

Specific report cover sheets/declarations are required

- Annex A RF Exposure Technical Brief Cover Sheet
- Annex B Declaration of RF Exposure Compliance

or

- Annex B Declaration of RF Exposure Compliance for Exemption from Routine Evaluation Limits



Role of TCBs & CABs

Use of FCC TCBs & IC CABs

Telecommunication Certification Body (TCBs) and Conformity Assessment Bodies (CABs) are organizations with the authority to issue Certifications for compliance with the respective regulations.

The 'Scope' of authority is however limited based on the expertise of the TCB/CAB.

The TCB/CAB authorization process:

- Offers manufacturers more than one approval body to select from
- Provide a faster turnaround than the FCC's direct authorisation process
- Keeps cost low and processing times fast via competition with other TCBs



TCB/CAB Restrictions

TCBs / CABs are not permitted to:

- Grant waivers or certify products where no FCC/IC regulations exist
- Certifying products on the FCC TCB Exclusion List
- Enforce FCC/IC rules
- Grant transfer of control of certifications
- Impose their own requirements



TCB/CAB Activities...

Key activities do include:

- Review test and application data from manufacturers or test laboratories
- Certify devices in accordance with FCC rules/ IC RSS standards and policies
- Verifying FCC / IC labelling requirements, including the FCC ID /IC Number
- Issue written FCC grants of certification / IC Technical Acceptance Certificates
- Approve permissive changes
- Perform post market audits of equipment they certify

Certifications are defined by their TCB/CAB Scope of Authority



Useful Information

FCC Knowledge Base (KDB)

- The formal mechanism for consulting with the FCC
- An online enquiry system open to everyone via <https://apps.fcc.gov/oetcf/kdb/index.cfm>
- Used for clarification of:
 - Applicability and interpretation of rule parts
 - Technical test requirements
 - General application of the regulations

Important Note:

Interpretation of the rules without consulting the FCC is **NOT** permitted.



FCC Knowledge Base (KDB) cont...

- KDB enquires and FCC replies are allocated KDB numbers
- Searchable references in the FCC/KDB website
- Some published and common KDB references:
 - **KDB 628591** TCB Exclusion List
 - **KDB 388624** Permit But Ask List
 - **KDB 178919** Permissive Changes
 - **KDB 784748** Labelling Guidance
 - **KDB 616217** SAR Laptop Procedure
 - **KDB 941225 D01** SAR 3G Test Procedures
 - **KDB 996369** Module Certification Guide



FCC Permit But Ask (PBA)

- The FCC apply restrictions on processing FCC filing for certain technologies or operating situation
- Application can be process via TCBs but only in agreement with the FCC first, hence “Permit But Ask”
- The PBA process is available to test firms, manufacturers and responsible parties, as well as TCBs
- Gives test labs and manufacturers the ability to consult with the FCC to ensure testing can proceed and confirm the test requirements
- This should be done **BEFORE** testing commences



Global Approvals: International Market Regulatory Requirements

Existing & Required Approvals

Think about the wider approvals requirements:

- What has been achieved?
- What needs to be achieved?

Order of approvals requirement:

- Approvals efficiency Vs commercial pressure

Acceptance of existing approvals documentation:

- Some countries accept CE / FCC test reports
- Recognised accreditation via MRA



In Country Testing Required?

Mandatory In-Country Testing

- E.g. China, Brazil, Taiwan

Understand what testing is required?

- Full type approval testing
- Pre-testing prior to full type approval testing (China)
- Functional performance testing (Malaysia)

Product Configuration Requirements:

- How should the equipment be configured for testing?
- How many samples of each configuration?
- What support equipment is required? For example, laptop, software etc
- What are labs test equipment capabilities? Can they support the product?
- Can simple, clear instructions be provided on operation of the product?

Is a product import permit required?



Application Submission

Documentation required is typically similar to the European TCF:

- Schematics
- Parts list
- Block diagram
- Quality assurance information (e.g. IS 9001)
- Example label
- User manual
- Local representative details
- Application Form

Clearly identify all key parts of the product i.e. radio circuitry



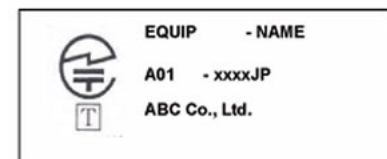
Example Label

The label needs to be of a specific format which may include:

- The approval logo or approvals mark
- A certification number
- Model name
- Brand
- Key warning / compliance statements



For some countries the label can not be completed until the final certificate has been issued!



User Manual

Could be specific user manual requirements, for example:

- Translated into the local language
- Must include key compliance or warning statements
- Model names should be detailed in the **EXACT** same format as on the application form



Local Representation

It may be a requirement for a locally based representative to act on your behalf. This could be:

- Your own regional office
 - An appointed local distributor
 - Requested by the lab/agent
-
- Local representative are usually based in the country where certification is required
 - Usually there is an annual fee!



The Application Form

To avoid re-submission costs, pay careful attention to the country application form, including:

- Applicant name
- Contact address details
- Model name – including any spacing between characters
- Local representation details
- Sign in the correct places by authorised personnel
(the applicant and local representative where required)



The Approvals Certificate

The certificate will be issued after:

- All testing has completed and reports are issued
- All documentation has been collected
- An application has been submitted
- The authority is happy with the application

The certification number will then be confirmed but:

- Check how long it is valid for (for example 1, 3 or 5 years)
- Know when and how it must be renewed
- Know how long that renewal process will take



Hints and Tips to Effective Global Approvals

In summary:

- Understand the process (documentation review or testing)
- Make sure samples configured correctly
- Know the capabilities of the test lab (can they test the product?)
- Ensure the documentation is correct (user manual, label)
- Get the application form correct (model names match user manual)
- Know if a local rep is required
- Know when to renew the application

Also, watch out for:

- National holidays, such as Chinese New Year
- Language issues



Examples

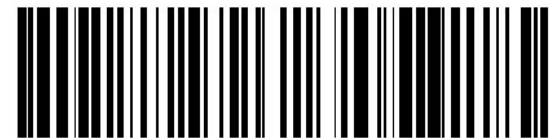
Brazil

Regulator is Agencia National de Telecomunicacoes (ANATEL)

- IS09001 QA certificate in Portuguese or notarised original
- Local testing is required (all requirements)
- Specific requirements for SAR testing
- Time limited approval certificates
- Specific labelling is required
- User Manual must be in Portuguese
- Local representative is required
- Typical project durations:
2 to 4 months



1672-09-5481



(01)0789xxxxxxxxxx

"Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário"



People's Republic Of China (PRC)

Regulator for Wireless devices is State Radio Regulatory Commission (SRRC).

- Local testing is required (all requirements)
- Factory inspection / quality system in place
- ISO9001 QA certificate
- Specific labelling is required
- Import permit is required
- Documentation in Chinese
- Local representative is required
- Time limited approval certificates:
1 to 5 years
- Typical project durations: 3 months



About Us

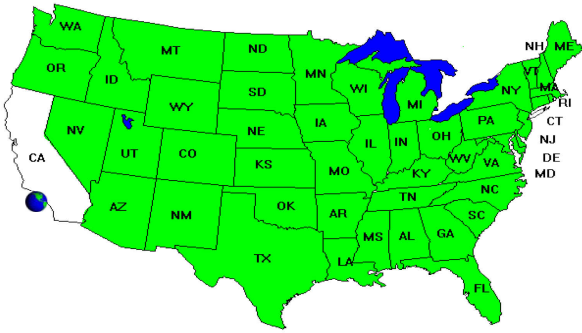


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WiSE USA



**UL CCS – Fremont
(Also known as:
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32 Staff**





WiSE Europe



RFI - Basingstoke

Unit 3, Hoizons, Wade
Road, Kingsland Business
Park, Basingstoke,
Hampshire, RG24 8AH

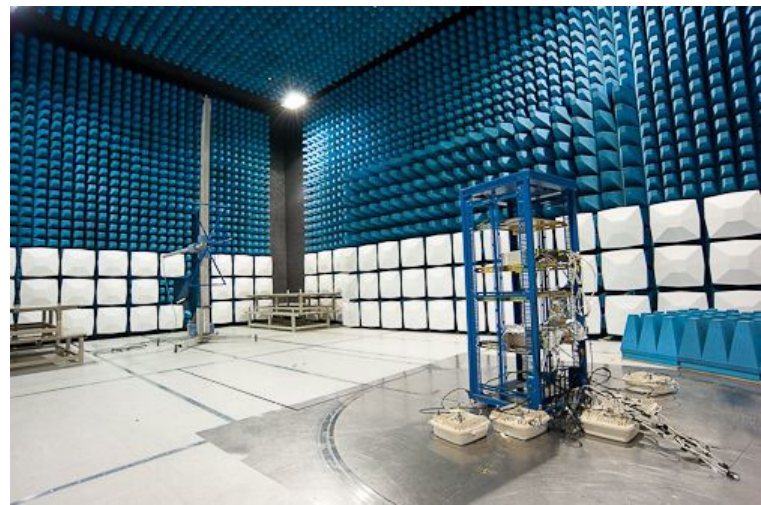
TEL: +44 1256 312000

FAX: +44 1256 312001

35 Staff



Radiated Measurements



At Kingsland Park facility
Semi-Anechoic Chamber
5m measurement distance
Reflecting ground plane

Measurements accepted by:
Europe, North America, Japan, Australia and others

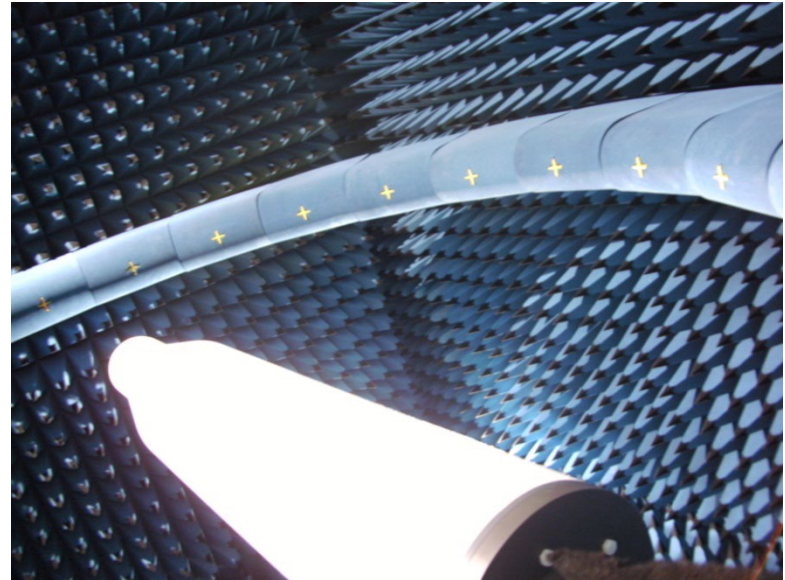
Radiated Measurements - Continued



At Kingsland Park facility
2 x Full-Anechoic Chamber
3m measurement distance
“Free space”, no reflections

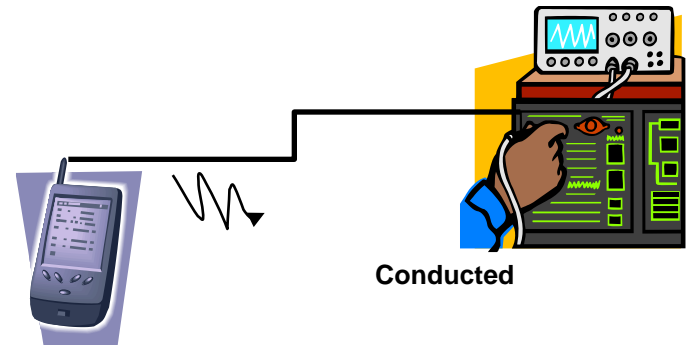
Measurements accepted by:
Europe, North America, Japan, Australia and others

Radiated Measurements – Antenna (OTA)

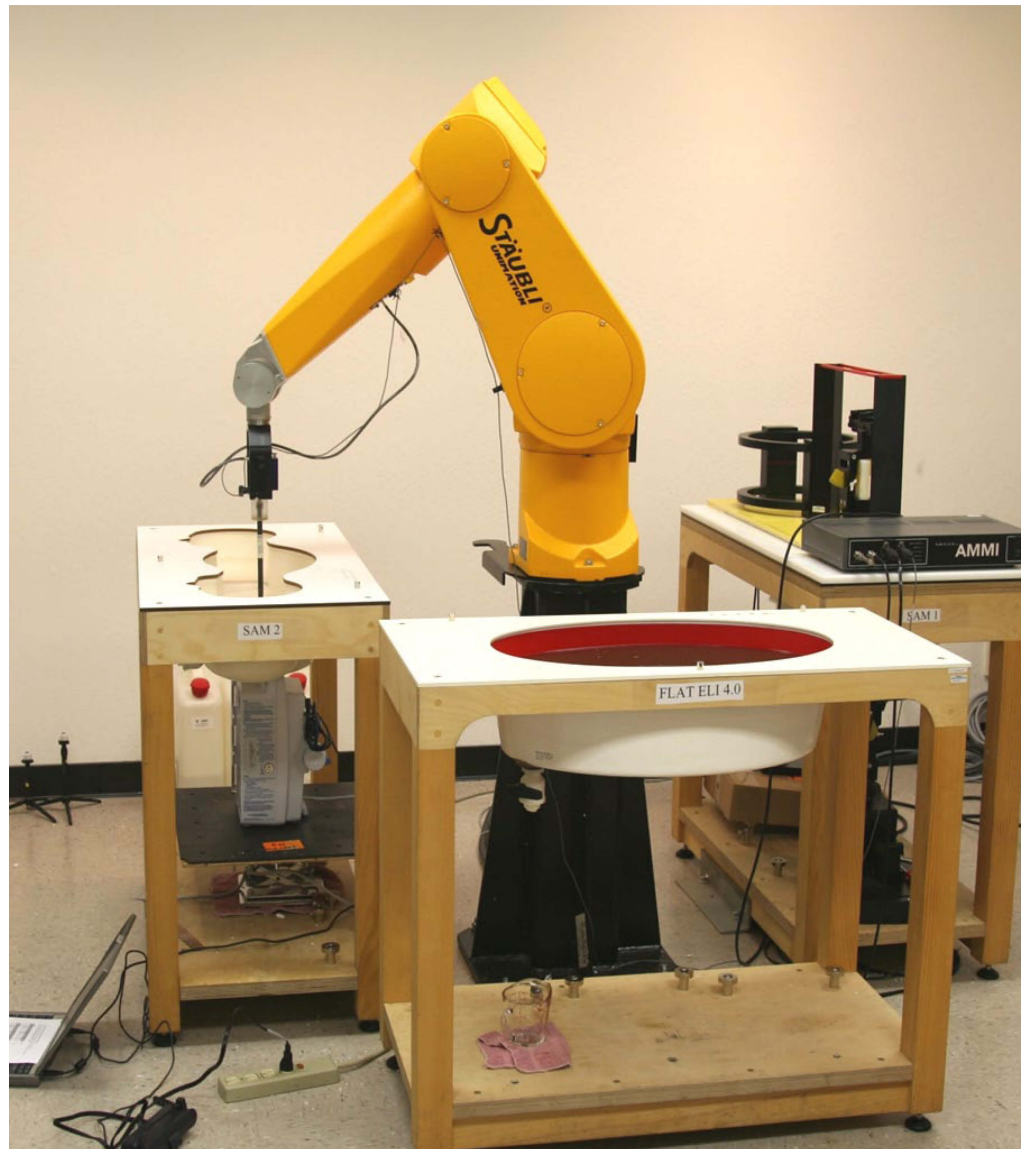


At Kingsland Park facility
Satimo StarGate 24 system
TRP, ERP, TIS, EIS
Active and Passive measurements
3D radiation pattern outputs
Measurements accepted by:
CTIA and GCF schemes

Conducted Measurements



Specific Absorption Rate



DASY5 SAR Measurement System

Specific Absorption Rate (SAR)

SAR testing places the wireless transmitting device next to a phantom that represents the specific part of the human body – head or torso:



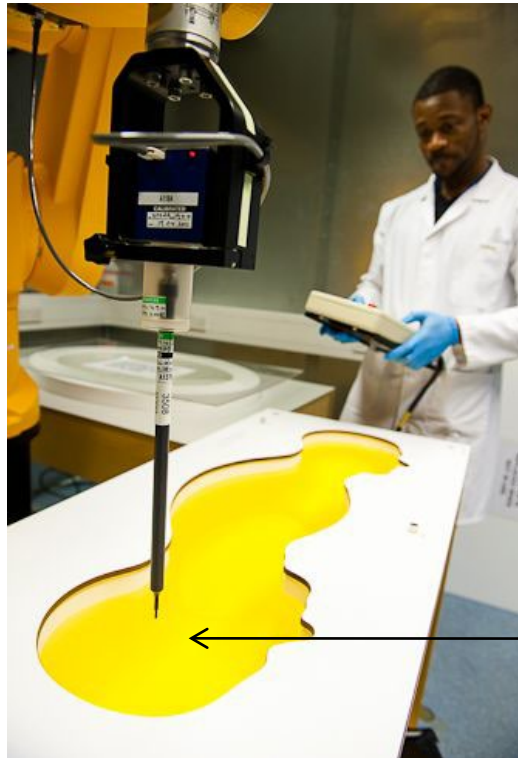
Measurement probe

Phantom - right side of head

Phantom – left side of head

Specific Absorption Rate (SAR)

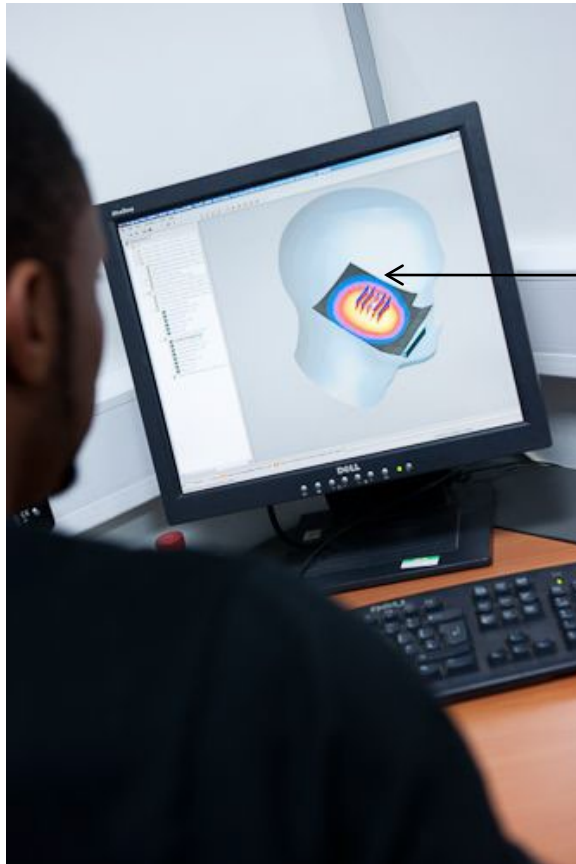
The phantom is filled with a fluid that replicates the human body.
The probe is precisely moved within the fluid.



Fluid

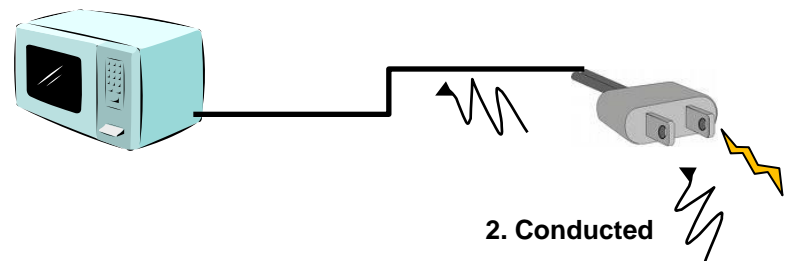
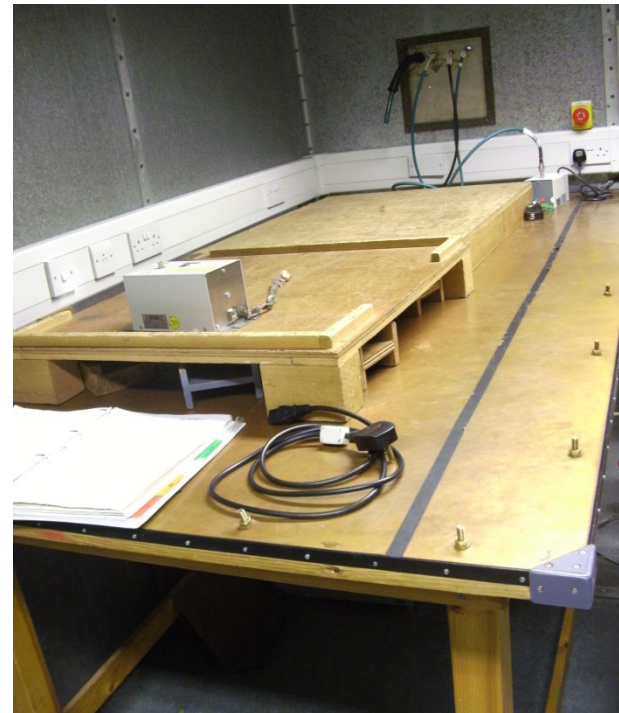
Specific Absorption Rate (SAR)

The probe measures numerous points in the fluid to establish a 3D model of the heat dissipation.

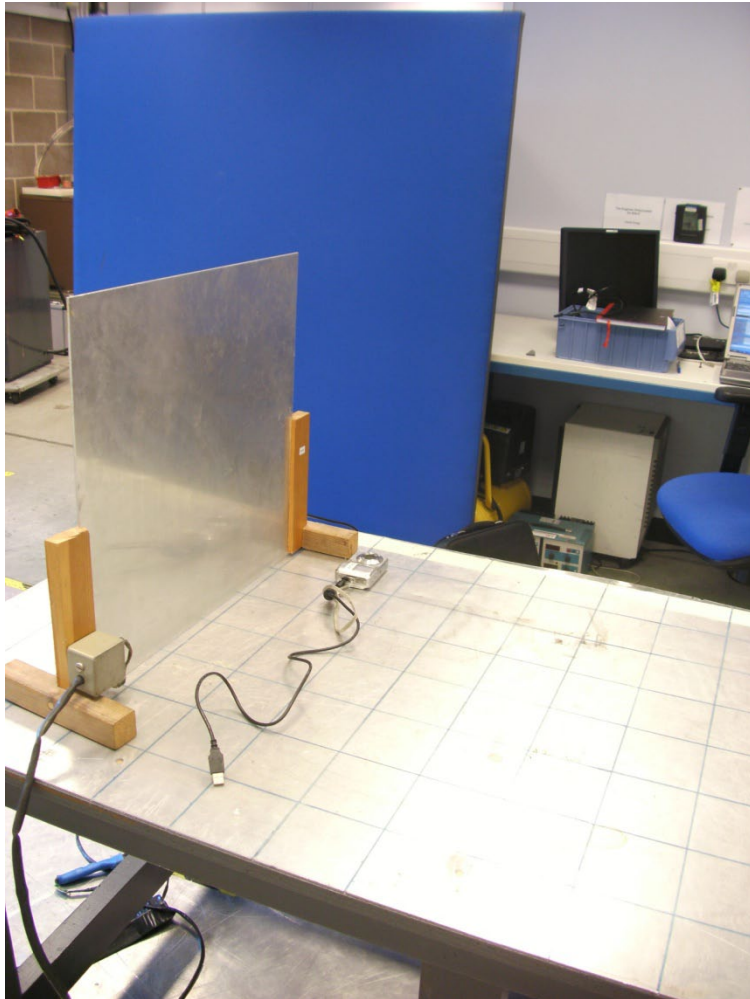


Model of heat pattern in fluid

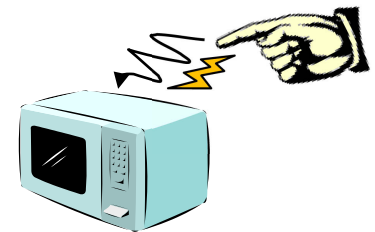
Electromagnetic Susceptibility (EMS)



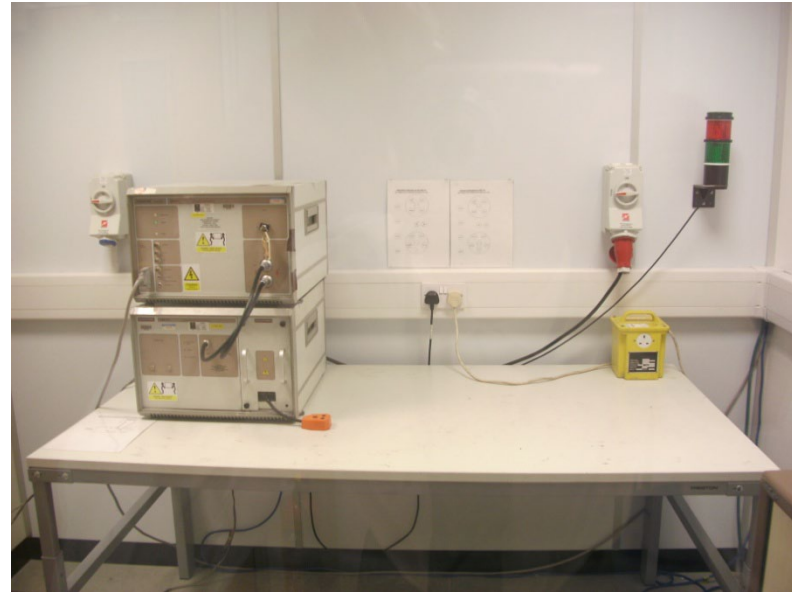
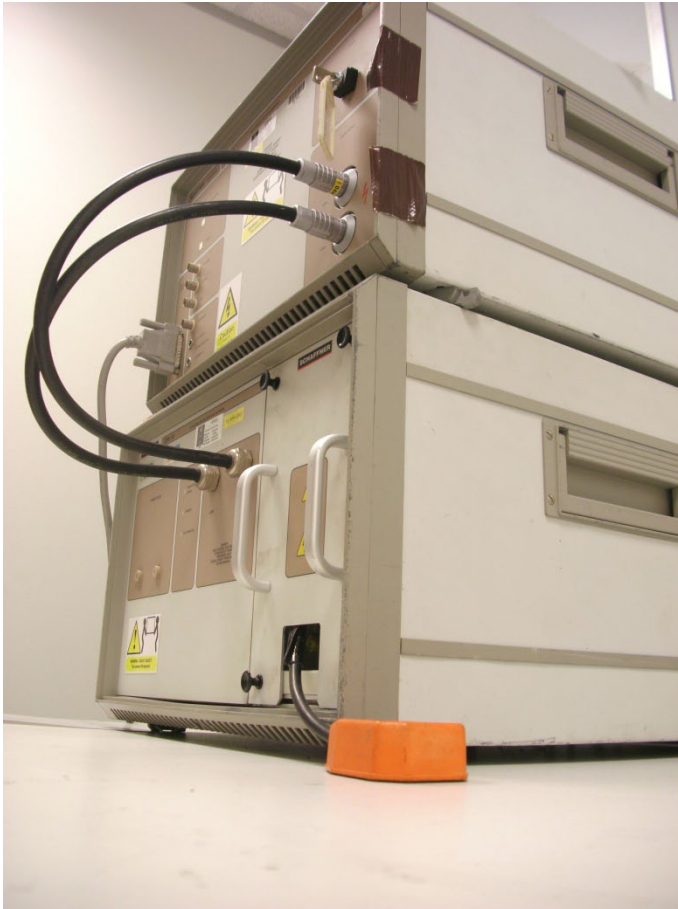
Electromagnetic Susceptibility (EMS)



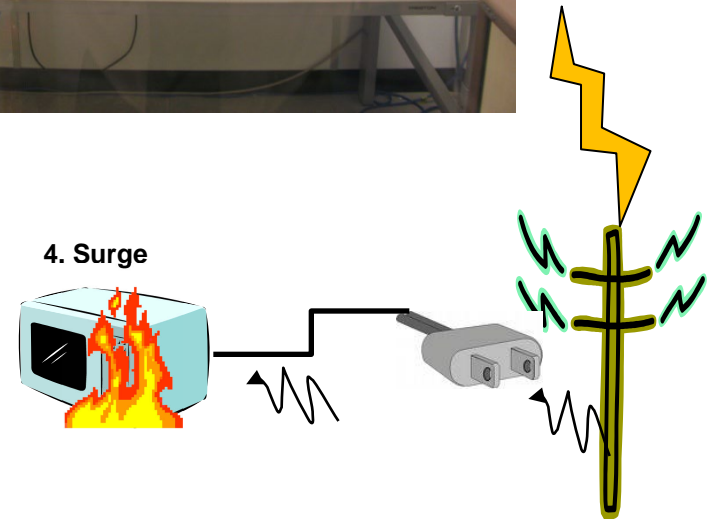
3. ESD



Electromagnetic Susceptibility (EMS)



4. Surge



“Any Questions?”

THANK YOU!

